

## PATENT CLAIMS

1. Printable and dispensable etching medium in the form of an etching paste having non-Newtonian, preferably thixotropic flow behaviour for the etching of amorphous, crystalline or partially crystalline surfaces of titanium oxides, characterised in that it is effective at 15 - 50°C and/or can be activated by input of energy and comprises the following components
- a) as etching component, ammonium hydrogen difluoride in a concentration of 8.5 - 9.5% by weight, based on the total amount
  - b) optionally at least one inorganic and/or organic acid having a content of 24 - 26% by weight, based on the total amount of the medium, where the organic acid present can be an organic acid having a  $pK_a$  value of between 0 to 5 selected from the group consisting of carboxylic acids, such as formic acid, acetic acid, dichloroacetic acid, lactic acid and oxalic acid,
  - c) a solvent selected from the group consisting of water, ethers, such as ethylene glycol monobutyl ether, triethylene glycol monomethyl ether, esters of carbonic acid, such as propylene carbonate, ketones, such as 1-methyl-2-pyrrolidone, as such or mixtures thereof in an amount of 52 - 57% by weight, based on the total amount of the etching medium,
  - d) 10.5 - 11.5% by weight, based on the total amount of the etching medium, of cellulose derivatives and/or polymers, such as polyvinylpyrrolidone, as thickener,
  - e) optionally 0 - 0.5% by weight, based on the total amount, of additives selected from the group consisting of antifoams, thixotropic agents, flow-control agents, deaeration agents and adhesion promoters.
2. Etching medium according to Claim 1, characterised in that it comprises ammonium hydrogen difluoride as etching component for oxidic surfaces, ethylene glycol monobutyl ether, triethylene glycol monomethyl ether, propylene carbonate and water as solvents, formic acid as organic acid and polyvinylpyrrolidone as thickener.

3. Process for the etching of amorphous, crystalline or partially crystalline surfaces of titanium oxides, characterised in that an etching medium according to one of Claims 1 and 2 is applied to the surface to be etched and is removed again after an exposure time of 0.1 - 15 min.
4. Process according to Claim 3, characterised in that an etching medium according to Claims 1-2 is applied over the entire surface or specifically in accordance with the etch structure mask only to the areas where etching is desired and, when etching is complete, rinsed off using a solvent or solvent mixture or fired in a furnace.
5. Use of an etching medium according to Claims 1-2 for the production of marks and labels and for improving the adhesion of  $Ti_xO_y$  glasses, ceramics and other  $Ti_xO_y$ -based systems to other materials by roughening.
6. Use of an etching medium according to Claims 1-2 in screen, template, pad, stamp, ink-jet and manual printing processes and the dispensing technique.
7. Use of an etching medium according to Claims 1-2 for the etching of amorphous, partially crystalline and crystalline  $Ti_xO_y$  systems, as uniform solid non-porous and porous solids or corresponding non-porous and porous layers of variable thickness which have been produced on other substrates.
8. Use of an etching medium according to Claims 1 to 2 for the removal of amorphous, partially crystalline and crystalline  $Ti_xO_y$  layers, for the selective opening of antireflection layers comprising  $Ti_xO_y$  systems for the production of two-stage selective emitters and/or local  $p^+$  back surface fields in solar cells.
9. Amorphous, partially crystalline or crystalline surfaces of titanium oxides which have been treated with etching media according to one of Claims 1 to 2.